

06371 USA

## APPENDIX

redirect the liquid which is on or near the wall back into the packing locally; B) those that attempt to re-collect all of the liquid flowing in the packing and on/near the wall, mix it to some degree, and redistribute it; and C) other approaches. The three categories are discussed below.

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*Category A: Re-introduction of liquid locally*

[0012] The theory behind this common approach is that the liquid flowing on the wall or along the outer periphery of the structured packing can be re-introduced at the periphery of the packing and will naturally flow back into the bulk of the packed bed. Most 10 structured packings used in this approach include one or more short bands of "wall-wiper" material (typically a metal foil or gauze) which is folded against the inside diameter of the column and against the periphery of the structured packing to reduce "liquid and vapor bypass."

[0013] U.S. Pat. No. 5,224,351 (Jeannot, et al.) discloses several types of wall-wipers 15 that collect liquid from the wall and wall region of the packing and attempt to re-introduce the liquid within the same packing layer or at the periphery of the layer below. These approaches have a claimed advantage of reducing vapor by-pass, as disclosed in EP997189 A1 (Klotz, et al.) However, as taught in U.S. Pat. No. 6,286,818 B1 (Buhmann), these conventional designs still result in accumulation of liquid on the wall or 20 near-wall region of the packing. Furthermore, the "wall-wiper" must be applied to each layer, or very frequently along the height of the packed bed. Applicants believe that the inefficiency of this approach lies in the fact that the liquid re-introduced to the packing from the wall or near-wall region enters the packing at the outer periphery, and will just as likely flow back toward the wall/near-wall region as flow toward the center of the 25 column.

[0014] Modifications of the edge of the packing also have been proposed as a means for redirecting the liquid back into the packing. Specific geometries for edge region folding and cutting and tools for producing these features have been disclosed in U.S. Pat. No. 5,224,351 (Jeannot, et al.). This approach is penalized by the increased cost 30 for tooling and special handling of each sheet of structured packing, as well as the increased assembly costs associated with the individual segments (or "bricks") of structured packing which must necessarily be assembled with the specific orientation mandated by the edge modification. Furthermore, as in the "wall-wiper" approach, the